REMARKS

Claims 1-16 are pending. Claims 1-16 stand rejected. Claim 4 is amended to correct antecedent basis. This amendment does not add new matter.

Rejections Under 35 U.S.C. § 102(b)

Claims 1, 3-6, 8-10, and 16 are rejected as being anticipated by U.S. Patent No. 5,532,659 by Dodart (hereinafter "Dodart"). For Dodart to anticipate claim 1, it must disclose each and every element as set forth in the claim in as complete detail as is contained in the claim, and the elements must be arranged as required by the claim.

Claim 1 recites "a shielded transition block having shielding configured to extend beyond a center pin tip." The Examiner states that Dodart teaches an edge connection structure including a shielded transition which extends beyond the tip of a coaxial cable center conductor. However, the Dodart's connection structure fails to disclose the recited shielded transition block. In particular, the fixed metal jaw **2** of Dodart does not have shielding extending beyond the tip of the coaxial cable center conductor. The metal cap **3** of Dodart, which is fastened to the fixed metal jaw with screws, extends beyond the tip of the coaxial cable center conductor. The Examiner characterizes the metal cap **3** as a view port in the rejections of claims 8 and 9. Hence, the metal cap **3** is separate from the jaw **2**. Neither the jaw **2** nor the cap **3** is a shielded transition block having shielding configured to extend beyond a center pin tip; therefore, claim 1 and all claims that depend from claim 1 are patentable.

Claim 3 recites "a coaxial connector interface; a center pin support, and a center pin having a center pin portion extending away from the center pin support to the center tip." A coaxial connecter interface allows coaxial cables to be connected to the connector (Written Description, ¶ **[0005]**). Dodart does not disclose the recited coaxial connecter interface, and teaches away from claim 3 because the coaxial cable **1** is soldered directly to the fixed metal jaw **2**. The Examiner states that the insulation of the coaxial line provides support for the coaxial cable center conductor; however, the connection of Dodart does not. Therefore, claim 3 is further patentable.

Claim 5, which depends from claim 3, recites that "the shielded transition block forms a controlled impedance structure with the center pin portion." Dodart does not disclose the recited center pin portion, and cannot form the recited controlled impedance

structure. However, even if the center conductor of the coaxial cable is taken to be a center pin portion (which it is not), Dodart still does not disclose the controlled impedance structure. The Examiner states that the device forms an airline portion where the insulation is removed and asserts that the device is impedance matched, referencing Fig. 2 and Col. 1, lines 16-30, which is the background section. Col. 1, lines 16-30 states that a prior art technique "does not ensure the constancy of transition impedance from one connection to another." This does not relate to the formation of a controlled impedance structure in the connection device of Dodart.

Fig. 2 of Dodart shows a gap between the conductor **53** and the edge of the jaw **2**. This gap forms an impedance discontinuity. Fig. 2 of Dodart also shows a substantial distance between the end of the conductor **53** and the end of the outer conductor **11** of the cable **1**. The insulator extends for a portion of this distance proximate to the outer conductor **11**, and does not extend for a portion of this distance proximate to the conductor **53**. This forms an impedance discontinuity.

Another impedance discontinuity is formed between the end of the insulation of the coaxial line **1** and the end of the conductor **53** ("the airline portion"). Specifically, the hole **23** in the jaw **2** into which the external conductor **11** is soldered forms an outer conductor for the airline portion that has a greater diameter than the external conductor **11**. This forms an impedance discontinuity because the dielectric constant of the insulation of the coaxial line is greater than the dielectric constant of air. An airline structure that maintains a controlled impedance should have an outer conductor that has a smaller diameter than the external conductor of the coaxial line (compare Fig. 2C of the instant application). Another impedance discontinuity occurs for the section of exposed insulator of the coaxial line because the diameter of the sidewall of the hole **23** is greater than the external conductor **11**.

In paragraph **[0026]**, the Applicants teach that "[p]roviding a shielding cavity with controlled impedance reduces the impedance discontinuity between the coaxial and planar transmission structure" and that "providing a shielding cavity with controlled impedance reduces the sensitivity of the PCA to PCB thickness and edge tolerances. The connection device of Dodart does not provide a controlled impedance structure, and claim 5 is further patentable. Claim 6, which depends from claim 3 and recites that "the shielded transition

block forms a controlled impedance airline structure with the center pin portion" is further patentable for at least similar reasons.

Claim 16 recites, among other elements, "means for a coaxial connector interface" and means for mounting the edge launch connector on a surface of a printed circuit board during a solder re-flow process". As discussed above in support of claim 3, Dodart does not disclose a coaxial connector interface, therefore claim 16 is patentable.

The Examiner states that the limitation of a solder reflow process is not given any patentable weight since only the final product structure is patentable in an apparatus claim. However, the reflowed solder results in a final product structure distinct from the prior art. The Applicants teach that using a solder reflow process provides a reliable solder joint between the center pin and the center pin solder pad (see ¶ **[0037]**, Fig. 1D, ref. nums. **54**, **88**) within the shielding of the shielded transition block. Dodart states that a solder link between the internal conductor **10** and the conductor **53** is made possible by the aperture formed through the notch **25** (Col. 3, lines 1-7). However, the aperture raises a problem since it lets through radio-electric radiation.

The Applicants teach in paragraph **[0036]** that a solder reflow process "mechanically secures the shielded end launch connector **50** to the PCB **72** and provides a continuous ground current path (*i.e.* "wraps" the ground current) around the center pin (see Fig. 1D, ref. num. **54**) and center pin solder pad **88** on the top side of the PCB **72**." The solder reflow process also allows the center pin to be soldered to the center pin solder pad within an enclosed electromagnetic shield without the notch **25** required by the connection device of Dodart for soldering the internal conductor **10** to the conductor **53**. A solder reflow process allows formation of a continuous ground current path concurrently with soldering the center pin to the center pin solder pad and provides a structure unachievable from the prior art disclosure. Therefore, claim 16 is patentable.

Rejections Under 35 U.S.C. § 103

Claim 7 stands rejected as being unpatentable over Dodart in view of U.S. Patent No. 5,339,187 by Nelson (hereinafter "Nelson"). Claim 7, which depends from claim 3, recites that "the pin support comprises a glass-to-metal seal." The Examiner cites Nelson for providing the general teaching of making a coaxial line with glass as the insulation. Fig. 2 of Dodart shows that the hole **23** is sufficiently large for insertion of the external

conductor **11**. The diameter of the insulator is less than the external conductor **11** and does not touch the sidewall (internal diameter) of the hole **23**. Merely making the coaxial cable of Dodart with a glass dielectric does not result in a pin support with a glass-to-metal seal. Therefore, claim 7 is further patentable.

Claims 1-6, 8-10, and 16 stand rejected as being unpatentable over U.S. Patent No. 5,897,384 by Hosler, Sr. (hereinafter "Hosler") in view of Dodart. The Examiner cites Hosler for teaching a shielded transition block, acknowledging that Hosler does not teach that the shielding extends beyond the center tip of the coaxial line. The Examiner cites Dodart for providing "the exemplary teaching of providing a lid (*i.e.* a cover providing a removable view port) which extends beyond the connection transition." The Examiner asserts that it would have been considered obvious to have included a removable lid extending beyond the connection transition such as taught by Dodart to the Hosler device because it would have provided the advantageous benefit of preventing parasitic radiation. The Applicants respectfully traverse the Examiner's position.

The connector of Hosler is "adapted for the ground circuits extend [*sic*] in a planar direction continuously from the connector to the circuit board, the ground circuits spaced apart from the signal circuit on either side an optimum distance on both the connector and the board circuit pads, meeting the requirements of a coplanar waveguide arrangement having the advantage of minimal signal degradation requiring minimal tuning of the circuit board after assembly." (Col. 4, lines 56-64) The metal cap **3** of Dodart is designed to "come in contact not only with the jaw **2** but also with the ground plane of the external face **51**." (Col. 3, lines 15-17) The printed circuit **5** of Dodart "is a stripline circuit whose external faces **51, 52** bear the ground planes and whose internal face has conductors such as the conductor **53**". (Col. 2, lines 9-11). Using the metal cap **3** of Dodart, which is intended to contact the ground plane of external face **51**, on the circuit of Hosler would undesirably couple, and probably even DC short, the ground plane of the coplanar waveguide to the center conductor of the coplanar waveguide. Modifying the connector as urged by the Examiner would render it inoperable for its intended purpose; therefore claim 1 and all claims that depend from claim 1 are allowable.

Claim 7, which depends from claim 3, recites that "the pin support comprises a glass-to-metal seal." The Examiner asserts that it would have been obvious to substitute glass in place of the Teflon insulation in the Hosler/Dodart connection structure. The

Applicants respectfully traverse. Hosler discloses that the inner conductor **40** is held in dielectric TEFLON sleeve **42** by small retention barbs **44**. Such small retention barbs are unlikely to hold the inner conductor in a glass sleeve because the glass is significantly harder than TEFLON and the barbs would not grip a glass sleeve in the same fashion. The entrance **50** of a glass sleeve would also be difficult to form, as would be the tapered lead-in at the socket contact section **46**. The socket contact section **46** has fingers that expand to accept a center pin of a mating connector. A glass sleeve would not "give", and may result in chipping or cracking at the entrance of the sleeve when a mating connector is attached. Similarly, the retention ring **52** is press fit, which might also chip or crack a glass sleeve.

Hosler teaches away from a pin support comprising a glass-to-metal seal because Hosler discloses using TEFLON as insulator material and provides specific reasons and structures for using a TEFLON sleeve **42**. Furthermore, merely replacing the TEFLON sleeve **42** with glass would not necessarily result in a glass-to-metal seal. Therefore, claim 7 is further patentable.

Claims 11-15 stand rejected as being unpatentable over Hosler, Dodart and in further view of U.S. Patent No. 6,661,318 by Tamaki et al. (hereinafter "Tamaki"). The Examiner acknowledges that the combination of Hosler and Dodart "do not explicitly teach that the shielding is soldered to the board and the tip is soldered to the solder pad on the board (Claim 11), that the board includes a via connection between the tip and the board conductor (Claim 12) a plurality of ground vias coupled to the outer conductor (Claim 13), or mechanical vias in the shielding solder area (Claim 14)." The Examiner urges that it would have been obvious to have provided a via transition to an internal layer of the board, grounding vias, and soldering the shielding and tip such as taught by Tamaki. The Applicants respectfully traverse the Examiner's position.

Claim 11, which depends from claim 1, recites, among other elements, "a center pin solder pad at an edge of the printed circuit board soldered to the center pin." Tamaki does not disclose such a center pin. The center conductor of the coaxial line **107** of Tamaki is soldered to pads set back from the edge of the printed circuit board (see e.g. Figs. 1A-4B, 5A, 5B, 6A-7B, 8A, 8B, 9A, 9B, and 12A-13B). This set-back allows the outer conductor of the coaxial line to be secured to the printed circuit board (see e.g. Fig.

6A, 6B). Therefore, Tamaki teaches away from a center pin solder pad at an edge of the printed circuit board soldered to the center pin and claim 11 is further patentable.

Claim 11 also recites, among other elements, "a shielding solder area at an edge of the printed circuit board soldered to the shielding." Claim 1 recites that the shielding of the shielded transition block is "configured to extend beyond a center pin tip of a coaxial transmission structure." As taught by the Applicants in paragraph **[0036]**, "[s]oldering the shielded transition block **52** to the shielding solder area **96** . . . provides a continuous ground current path (*i.e.* "wraps" the ground current) around the center pin". Tamaki does not disclose or suggest such a shielded transition block, and therefore claim 11 is further patentable.

Claim 12, which depends from claim 11, recites, among other elements, that the printed circuit board further comprises "a center conductor via electrically coupling the center pin solder pad to the center conductor. The Examiner states that Hosler is silent as to the type of conductor transmission line that is on the board (Detailed Action, page 6, lines 11-12); however, this is not true. Hosler states that the connector is "adapted for the ground circuits extend [*sic*] in a planar direction continuously from the connector to the circuit board, the ground circuits spaced apart from the signal circuit on either side an optimum distance on both the connector and the board circuit pads, meeting the requirements of a coplanar waveguide arrangement having the advantage of minimal signal degradation requiring minimal tuning of the circuit board after assembly." (Col. 4, lines 56-64) (emphasis added) There is no motivation to provide a center conductor via for a coplanar waveguide formed on a surface of a circuit board, Hosler teaches away from the proposed modification, and claim 12 is further patentable.

Claim 13, which depends from claim 12, recites that the connector further comprises "a plurality of ground vias coupled to an outer conductor of the coaxial connector interface and selectively disposed in relation to the center conductor via to improve impedance continuity between the coaxial connector interface and the planar controlled impedance transmission structure." The Examiner refers to Fig. 13B of Tamaki, and states that "the grounding vias such as taught by Tamaki would have provided the advantageous benefit of selecting/regulating the impedance of the stripline." Claim 13 is not directed at selecting or regulating the impedance of a stripline. Referring to Fig. 13B of Tamaki, there is no center conductor via. The ground vias do not improve

impedance continuity between the coaxial line **107** and the stripline **105**. Referring to Fig. 16A of Tamaki, vias **2011** appear to merely couple the first ground **2003** layer, which is soldered **2013** to the outer conductor **2012** of the coaxial line **2008**, to the second ground **2004** layer. The ground vias **2011** are not selectively disposed in relation to the center conductor via **2006** to improve impedance continuity between the coaxial line **2008** and the stripline **2005**.

[0001] Claim 14, which depends from claim 13, recites that the connector further comprises "mechanical vias in the shielding solder area. The Examiner asserts that the vias are the same in structure as the presently claimed invention, and as an obvious consequence provide some mechanical support. The Applicants respectfully traverse. The Applicants teach that "[m]echanical vias or through holes **134** are placed in the shielding solder area **96'**, *i.e.* under the shielding portion of the shielded edge launch connector (*e.g.* shielding **56** in Fig. 1A or flange **120** in Fig. 2B) to increase mechanical strength. The mechanical vias also allow excess solder to flow into them during solder reflow, instead of bulging out from under the shielding and shorting the center pin solder pad **88'** to electrical ground."

Comparing Figs. 6A and 6B of Tamaki, for example, with Fig. 3 of the instant patent application, two important differences are shown. First, the ground vias shown in Fig. 6B do not lie beneath the outer conductor of the coaxial line because the coaxial line is not sectioned in this view. Second, the ground vias are covered on both the first and second ground plans by the metal of those layers. In other words, it appears that the ground vias were filled or plated prior to formation of the first and second grounds. Thus it is not an obvious consequence that they provide any more mechanical support to the outer conductor than if there were omitted.

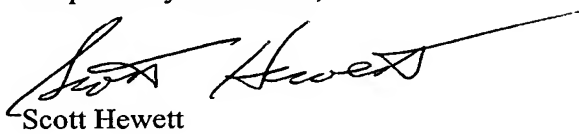
Similarly, since the ground vias of Tamaki are covered by the metal ground layers, they cannot allow excess solder to flow into them during solder reflow, which the applicants teach is desirable to avoid shorting. Therefore claim 14 is further patentable.

CONCLUSION

The Applicants submit that all claims are now in condition for allowance. Favorable reconsideration and timely issuance of a Notice of Allowance are respectfully requested. Should the Examiner consider necessary or desirable any formal changes

anywhere in the specification, claims, and/or drawings, then it is respectfully asked that such changes be made by an examiner's amendment, if the Examiner feels this would facilitate passage of the case to issuance. If the Examiner believes a telephone conference would expedite prosecution of this application, the Examiner is cordially invited to telephone the undersigned at (707) 591-0789.

Respectfully Submitted,



Scott Hewett

Scott Hewett
Patent Attorney
400 West Third Street, No. 223
Santa Rosa, CA 95401
Tel.: (707) 591-0789
Fax.: (707) 591-0392